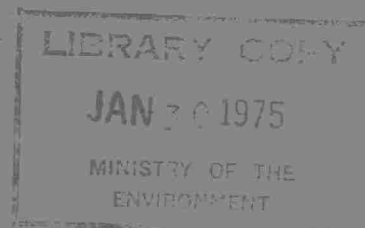


OPERATING SUMMARY

WOOLWICH TWP.

LABORATORY & FIELD
WORKSHEET FOR THE ENVIRONMENT



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WOOLWICH TWP.

WATER POLLUTION CONTROL PLANT
and
WATER TREATMENT PLANT

MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY

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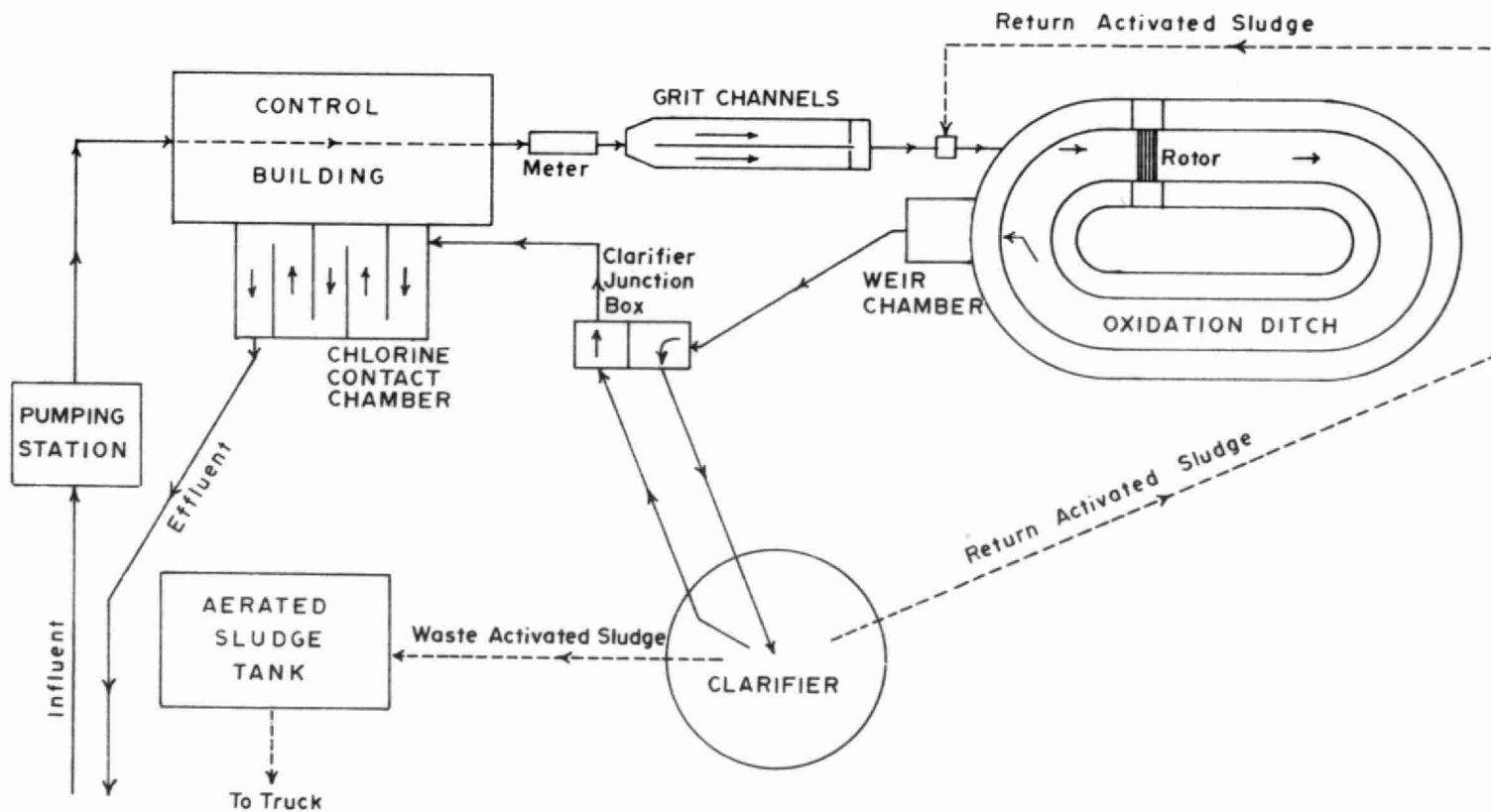
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WATER POLLUTION CONTROL PLANT

TOWNSHIP OF WOOLWICH
WATER POLLUTION CONTROL PLANT



DESIGN DATA

Project No:	1-0063-67
Treatment:	Extended Aeration
Design Flow:	0.21 MGD

RAW SEWAGE PUMPING:

Two, Type: FLYGT CP-3150
Size: 600 USGPM at 24' TDH

GRIT CHANNELS:

Two, 19' x 1.6' x 2.2'
Volume (each) 420 I. Gal.
Detention: (each) 2.8 min.

OXIDATION DITCH:

Volume: 200,000 I. Gal.
WL Dept. 5' Detention: 22.8 hours

Rotor - Type: Pumps and Softners
Size: 15' length

CLARIFIER:

24' dia. x 9.5' swd
Volume: 27,000 I. Gal.
Detention: 3.1 hours
Mechanism: DORR OLIVER LONG
Overflow Rate: 465 gpd/sq. ft.

CHLORINE CONTACT CHAMBER:

5 passes, each 12.3' x 2.5' x 5' awl
Volume: 4,800 I. Gal.
Detention: 33 min.

'73 Review

GENERAL

The St. Jacob's water pollution control plant is a 0.16 mgd oxidation ditch, utilizing the extended aeration process. The sewage treatment plant consists of screening facilities, grit channel, oxidation ditch, final settling, chlorination, and sludge holding facilities. There is a pumping station on site, and a sewer collector system associated with this project. The water pollution control plant, collector system, and the water treatment plant are all operated by one operator with the assistance of casual help.

PLANT FLOWS AND CHLORINATION

The total raw sewage flow treated for 1973 was 46.63 million gallons. This represents an average daily flow of 0.13 million gallons or 81 percent of the plant design capacity.

An average of 14 mg/l chlorine dosage was required to maintain an average chlorine residual in the final effluent of 0.5 mg/l.

AERATION

The average MLSS concentration of 6710 mg/l and F/M ratio of 0.073 are within the acceptable limits for the extended aeration process.

PLANT EFFICIENCY

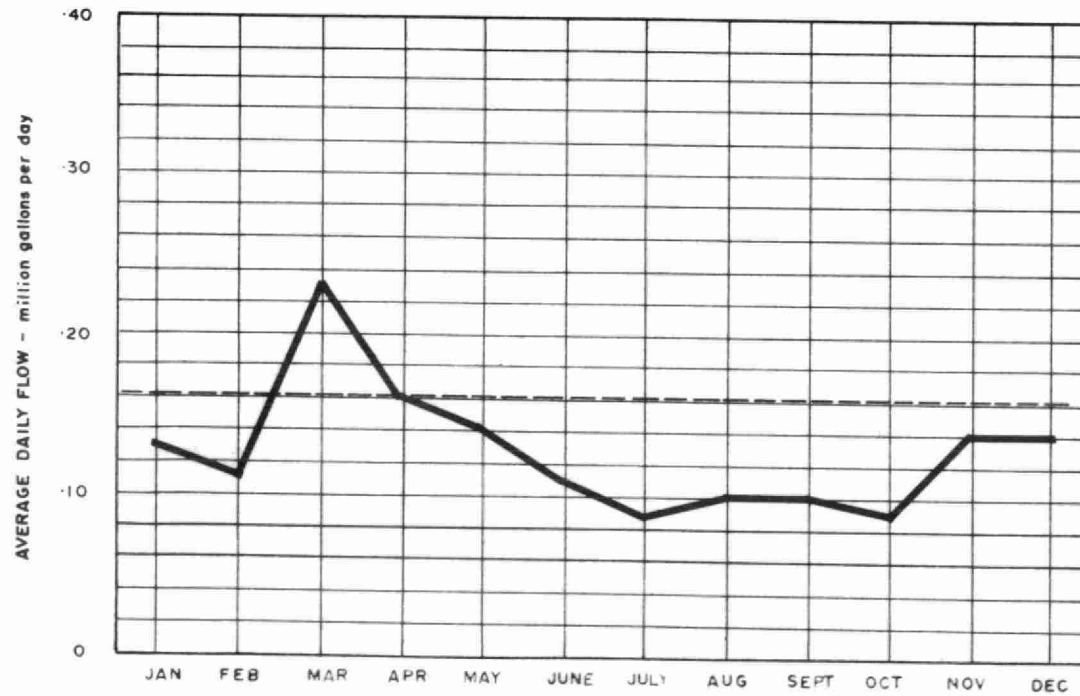
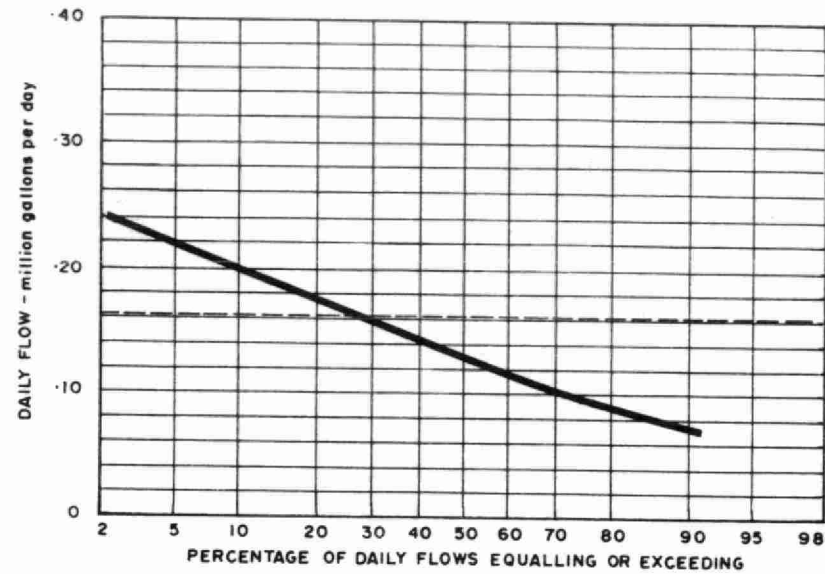
The average BOD and suspended solids concentrations in the influent were 480 and 500 mg/l respectively. The effluent BOD and suspended solids concentrations of 21 and 30 mg/l were both above the Ministry of the Environment objective of 15 mg/l for each. Removal efficiencies for BOD and suspended solids were 96 and 94 percent respectively.

CONCLUSIONS

Under the supervision of head office personnel the staff at the St. Jacob's W.P.C.P. operated a clean, attractive and efficient plant for St. Jacob's.

PROCESS DATA

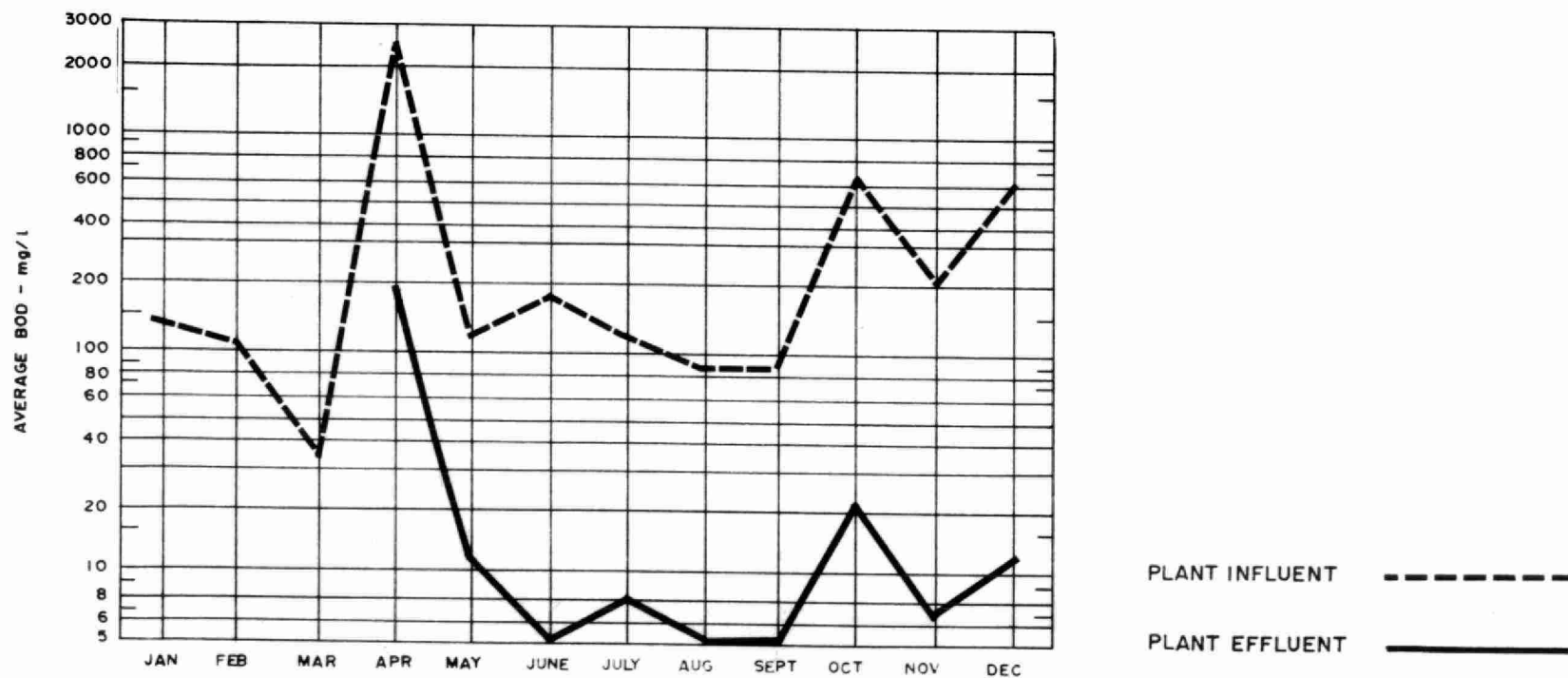
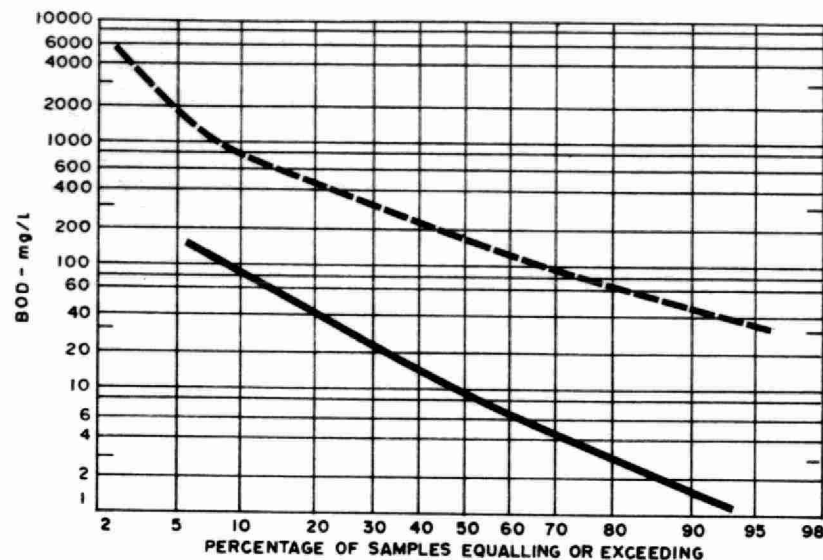
FLOWS



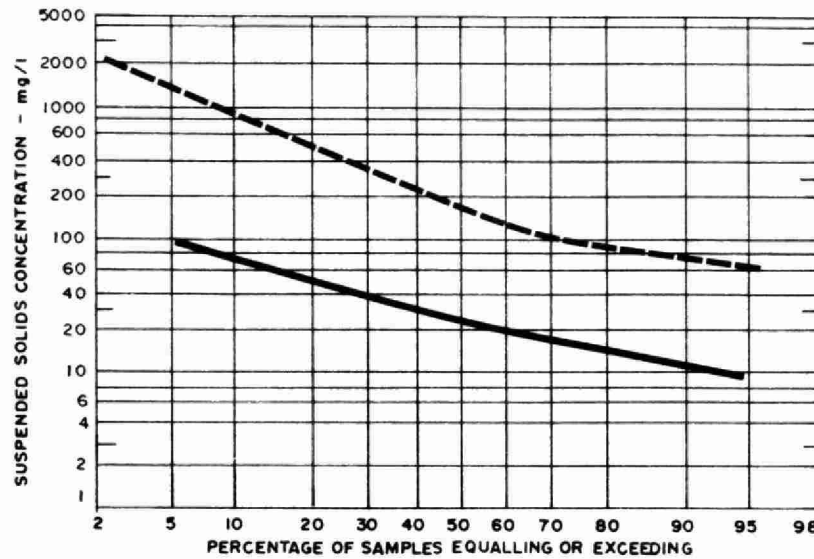
PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l P	mg/l P
JAN	4.03	0.13	0.20	120				87				4.0	
FEB	3.18	0.11	0.16	110				320				3.8	
MAR	6.98	0.23	0.41	34				40				2.0	
APR	4.80	0.16	0.26	2700	180	93	120.4	90	90	0	0	3.5	4.2
MAY	4.45	0.14	0.20	110	11	90	4.4	400	18	95	16.9	8.2	3.0
JUNE	3.19	0.11	0.16	180	5	97	5.5	180	15	92	5.2	4.7	2.7
JULY	2.64	0.09	0.13	120	8	93	2.8	80	10	88	1.8	4.5	4.0
AUG	3.05	0.10	0.16	85	5	94	2.4	930	20	98	27.7	10.0	2.6
SEPT	2.87	0.10	0.13	85	5	94	2.3	140	18	87	3.6	5.7	2.6
OCT	2.92	0.09	0.14	650	22	97	18.2	1300	57	96	36.1	9.4	1.0
NOV	4.06	0.14	0.23	200	7	97	7.8	160	35	78	5.1	12.5	2.0
DEC	4.46	0.14	0.24	600	12	98	26.2	1900				3.8	1.2
TOTAL	46.63	-	-	-	-	-		-	-	-		-	-
AVG.		0.13	MAXIMUM 0.41	480	21	96	21.1	500	30	94	13.8	6.8	2.5
No. of Samples	-	-	-	30	16	-	-	33	16	-	-	32	15

BIOCHEMICAL OXYGEN DEMAND

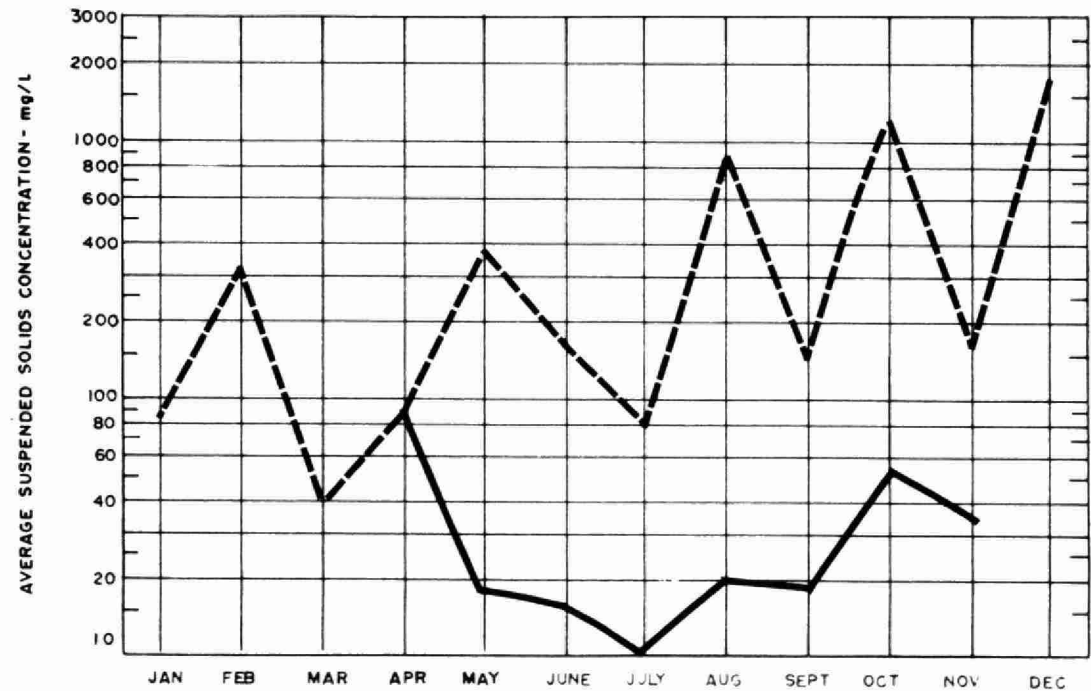


SUSPENDED SOLIDS

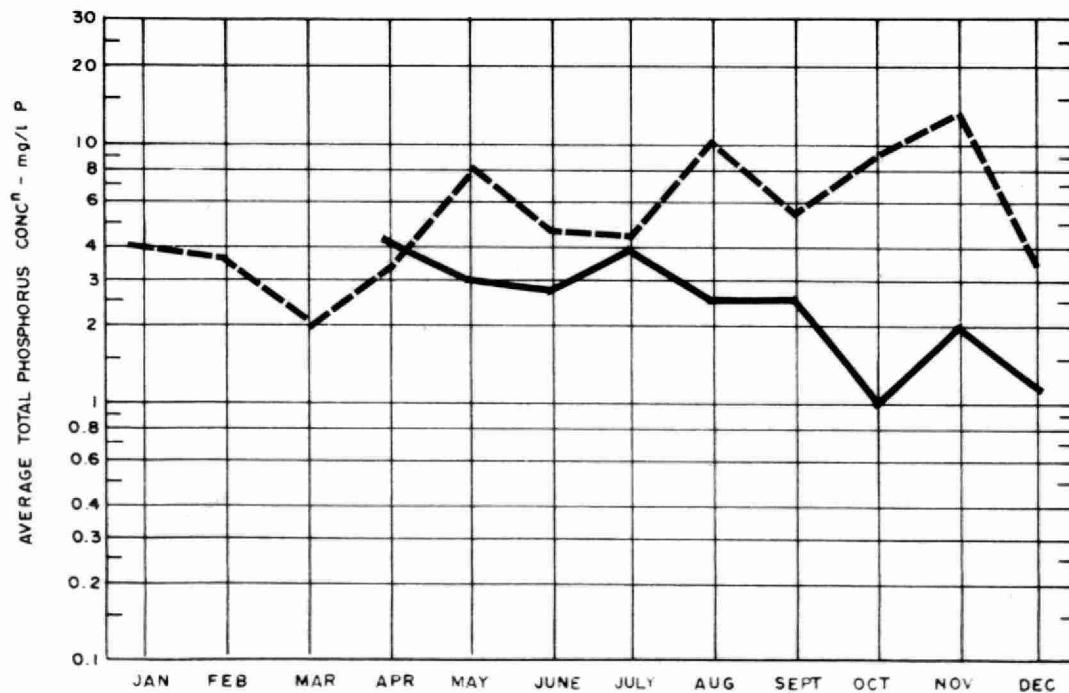
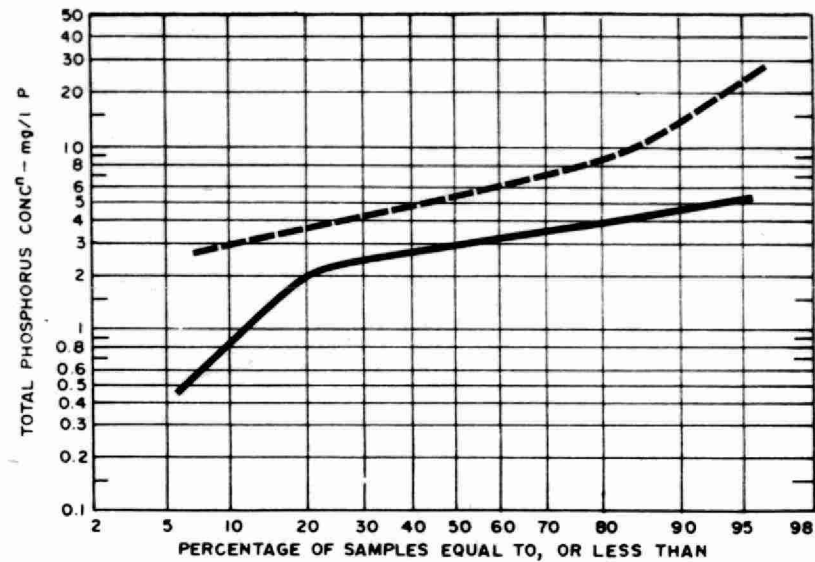


PLANT INFLUENT - - - - -

PLANT EFFLUENT _____



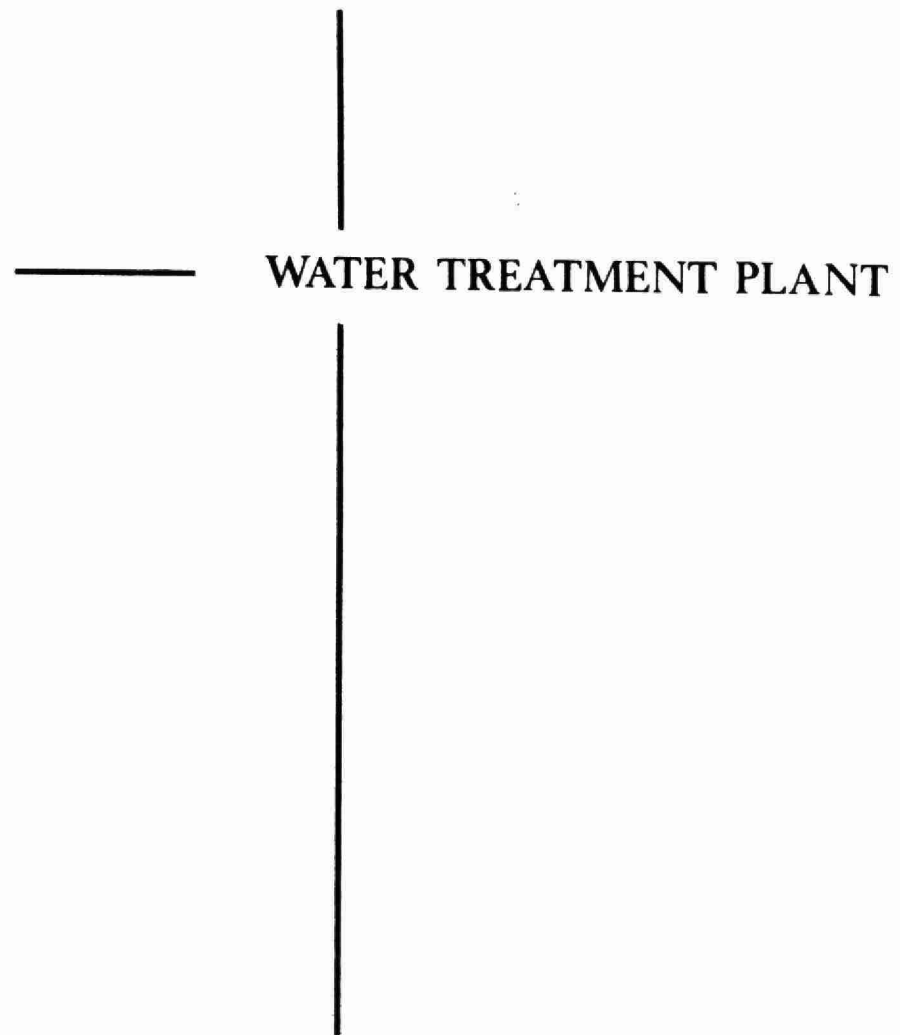
PHOSPHORUS



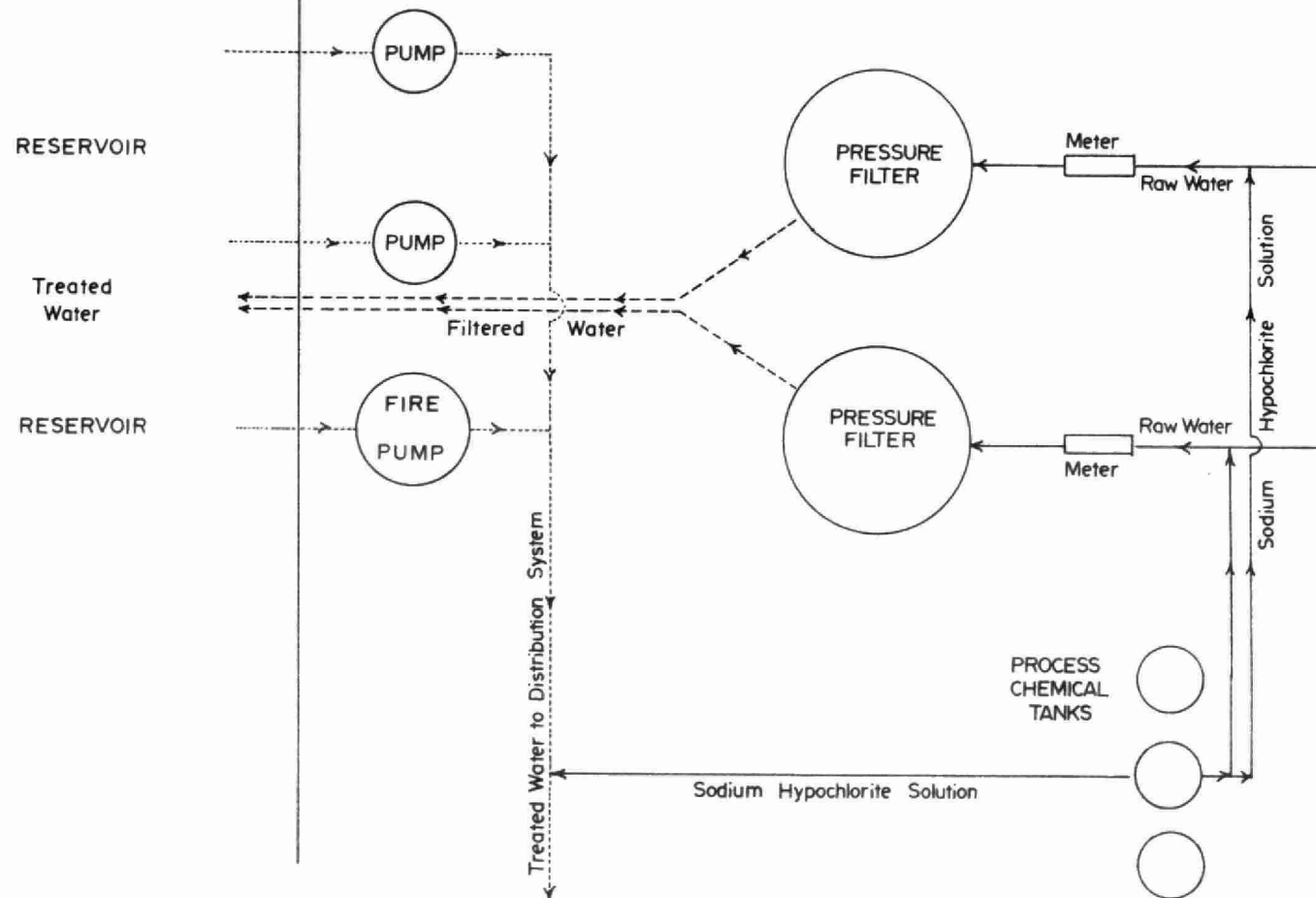
PLANT INFLUENT -----
PLANT EFFLUENT _____

TREATMENT DATA

MONTH	GRIT	CHLORINATION		AERATION			WASTE SLUDGE			AEROBIC DIGESTER			
	QUANTITY REMOVED	NaOCl USED	AVG. DOSAGE	MLSS CONC	F/M	AIR USED	QUANTITY	SUSPENDED SOLIDS	VOL. SOLIDS	QUANTITY REMOVED	SUSPENDED SOLIDS	VOL. SOLIDS	AMOUNT HAULED
	cubic feet	gallons	mg/l	mg/l	day ⁻¹	$\frac{1000 \text{ ft}^3}{\text{lb BOD}}$	10^3 gallons	mg/l	%	10^3 gallons	mg/l	%	cubic yards
JAN	11	72	2.1	5300	0.020		416			0.2			
FEB	7	57	2.1	6030	0.010		290						
MAR	5	79	1.4	6100	0.004		375			504.00			
APR	14	80	2.0	3020	0.710		91						
MAY	9	66	1.8	5800	0.010		45						
JUNE	12	79	3.0	6470	0.010		95						
JULY	19	86	3.9	7280	0.007		110						
AUG	15	84	3.3	7150	0.006		60						
SEPT	12	68	2.8	7640	0.004		38						
OCT	36	81	3.3	6550	0.040		31						
NOV	21	76	2.2	11200	0.010		34						
DEC	25	82	2.2	8000	0.050		17			3.0			
TOTAL	169	910	-	-	-	-	1602	-	-	507.7	-	-	
AVG.	3.6 cu. ft/mil gal	76	2.5	6710	0.073		134			169.1			



WOOLWICH TWP. WATER TREATMENT PLANT



DESIGN DATA

PROJECT NO: 5-0033-67

Treatment: Filtration and Chlorination

Design Flow: 0.165 MGD

Well No 1: Pump: 1, Type: PLEUGER N-65
Size: 60 IGPM at 184' TDH
Well No 2: Pump: 1, Type: PLEUGER N-64
Size: 55 IGPM at 178' TDH

TREATMENT PLANT

Filters: 2, Type: DURO Mod AF 60 Pressure anthracite
filter

Loading : 3 GPM/ft²

Hypochlorination

Prechlorination Pump: 1, Type: PRECISION 12161-11
Size: 38 GPD man.

Postchlorination Pump: 1, Type: PRECISION 12161-41
Size: 38 GPD max.

SERVICE PUMPS 2, Type: CANADA PUMPS 25A
Size: 150 USGPM at 103' TDH (each)

FIRE PUMP 1, Type: CANADA PUMPS 55
Size: 950 USGPM at 155' TDH

RESERVOIR Capacity: 200,000 USG

STANDBY DIESEL 1, Type: DIETZ

'73 Review

GENERAL

The St. Jacobs treatment facilities consist of two separate wells containing Pleuger submersible pumps, which pump to a reservoir adjoining the main plant. From the reservoir the well water passes through pressure filters to the distribution system receiving chlorination en route.

There are two service pumps for distribution to consumers, and a fire pump equipped with a diesel engine to provide uninterrupted flow during power failure.

The St. Jacobs treatment plant has a capacity of 165,000 gallons per day. The total plant output for the year was 26.66 million gallons, representing an average daily flow of .073 million gallons.

PLANT EFFICIENCY

The well water has a very high iron content that is effectively reduced by passage through the pressure filters. Also a high sulphate content in the well water indicates a change in the two water producing areas of the wells, and suggests that repairs will have to be made to both wells to overcome this problem.

Bacteriological samples collected from the treated water at the plant were all coliform-free.

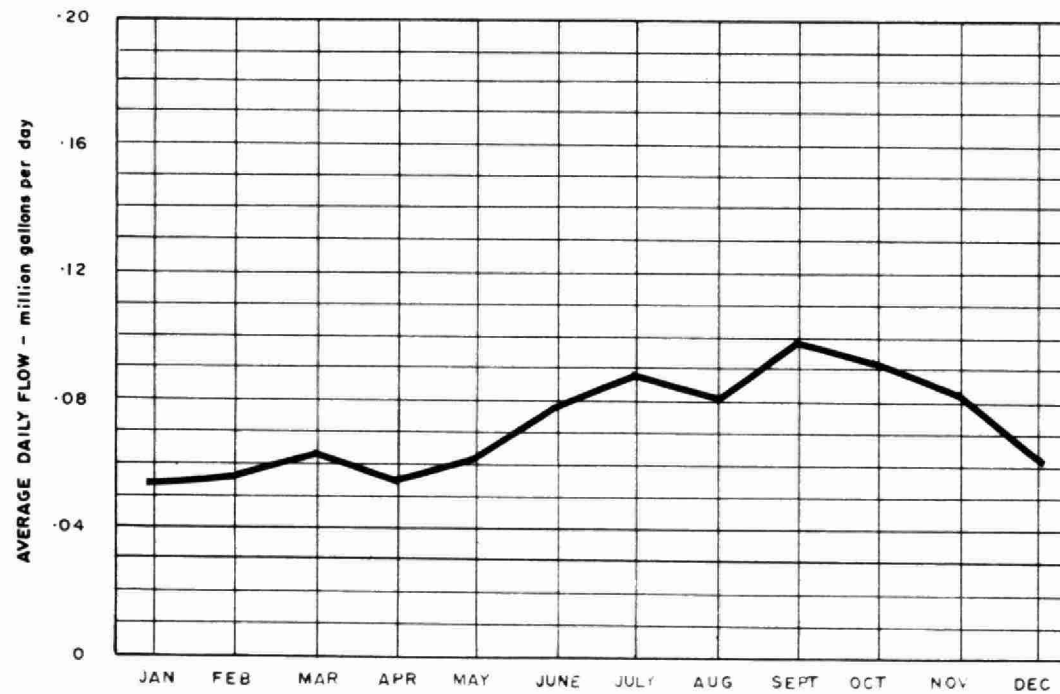
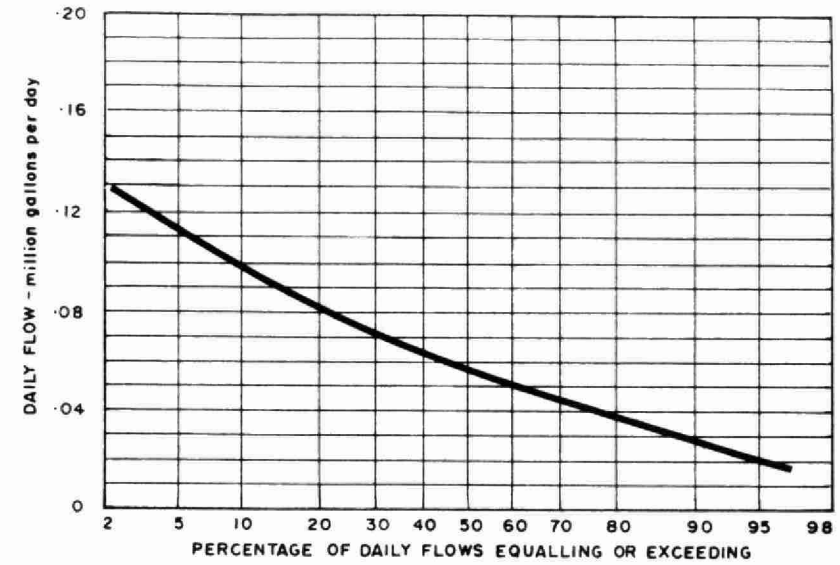
CHLORINATION

An average daily dosage of 0.6 gallons sodium hypochlorite solution was introduced to maintain a residual of 0.2 parts per million.

CONCLUSIONS

The plant was operated in conjunction with the W.P.C.P. by Mr. R. Everall and part-time help. Under the supervision of head office personnel, the staff operated a clean, attractive and efficient plant for St. Jacobs.

PROCESS DATA FLOWS



DESIGN CAPACITY _____

PLANT PERFORMANCE

MONTH	FLOWS			RAW WATER		CHLORINATION		
	TOTAL PLANT OUTPUT million gallons	AVERAGE DAILY FLOW million gallons	MAXIMUM DAY'S FLOW million gallons	TEMPERATURE		TOTAL AMOUNT OF NaOCl used gallons	PRE- DOSAGE mg/l	RESIDUAL IN PLANT EFFLUENT mg/l
				AVERAGE ° F	MAXIMUM ° F			
JAN	1.72	0.056	0.102			12.0	0.7	0.2
FEB	1.61	0.057	0.095			11.5	0.7	0.1
MAR	1.93	0.064	0.098			15.0	0.8	0.1
APR	1.69	0.056	0.086	40	40	14.0	0.8	0.1
MAY	1.90	0.061	0.096	43	43	12.6	0.7	0.2
JUNE	2.37	0.079	0.166	40	43	19.5	0.8	0.2
JULY	2.74	0.088	0.156	40	40	22.0	0.8	0.2
AUG	2.49	0.080	0.158	40	40	23.0	0.9	0.2
SEPT	2.98	0.099	0.200	40	40	28.2	0.9	0.2
OCT	2.85	0.091	0.140	40	40	27.0	0.9	0.2
NOV	2.45	0.082	0.144	40	40	23.0	0.9	0.2
DEC	1.93	0.062	0.128	40	40	20.5	1.1	0.2
TOTAL	26.66					228.3		
AVG.		0.073	MAXIMUM 0.166	40	MAXIMUM 43	0.6 gallons per day	0.9	0.2

PLANT PERFORMANCE

MONTH	RAW WATER					PLANT EFFLUENT		DISTRIBUTION SYSTEM		FILTER OPERATION			
	NUMBER OF SAMPLES HAVING TOTAL COLIFORM ORGANISMS PER 100 ml OF					NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	AVERAGE FILTER RATE gpd/ft ²	AVERAGE FILTER RUN HOURS		BACKWASH WATER USED mil. gal.
	0	1 - 3	4 - 32	33 - 320	> 320						Max.	Min.	
JAN	2					2	0	4	0	152	7	4	0.025
FEB	2					2	0	4	0	94	9	4	0.022
MAR	1					1	0	2	0		8	5	0.023
APR	1					0	0	3	0	120	6	4	0.020
MAY	3					0	0	5	0	110	7	4	0.020
JUNE	3					0	0	5	0	110	9	4	0.058
JULY	2					0	0	6	0	110	9	4	0.059
AUG	2					0	0	3	0	130	8	4	0.052
SEPT	3					0	0	5	0		12	4	0.035
OCT	1					0	0	3	0		12	8	0.065
NOV	1					0	0	3	0		10	6	0.060
DEC	1					0	0	3	0	135	7	5	0.035
TOTAL	22					5	0	46	0				0.474
AVG.	0 (NOTE - Average shown is the GEOMETRIC MEAN)									120	9	4	0.40

WATER QUALITY

PROPERTY	RAW WATER				TREATED WATER				DESIRABLE STANDARDS
	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	
HARDNESS in mg/l as CaCO_3	2	571	635	508	4	538	630	452	80 - 100
ALKALINITY in mg/l as CaCO_3	2	201	204	198	4	204	206	202	30 - 100
IRON in mg/l Fe	2	0.58	0.60	0.55	4	0.15	0.38	< 0.10	Less than 0.3
CHLORIDE in mg/l Cl^-	2	2	2	2	4	3	3	3	Less than 250
pH in pH units	2	7.5	7.6	7.4	4	7.6	7.8	7.4	7.0 - 8.5
CONDUCTIVITY in micromhos per cm^3	2	1032	1125	940	3	1120	934	840	
AMMONIA in mg/l as N	2	0.19	0.19	0.18	4	4.09	16.00	0.02	Less than 0.5

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